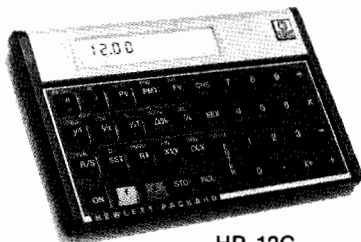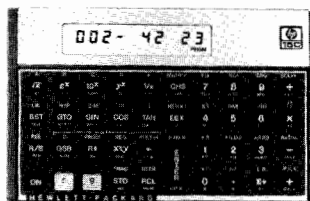# PERSONAL COMPUTERS & CALCULATORS
Personal Computation
Models HP-11C, HP 12-C, HP-15C, HP-16C, HP-28, HP-41CV, HP-41CX

HP-12C

HP-15C

What's Right for You?

Whether it's a business or scientific calculator, or a handheld computer, Hewlett-Packard products can give you the sense of pride that comes from knowing you own a computational tool that has been designed—in every detail—to be the finest of its kind.

The HP-11C, HP-12C, HP-15C and HP-16C are stand-alone programmable calculators. The Business Consultant professional calculator can be enhanced with an optional cordless printer.
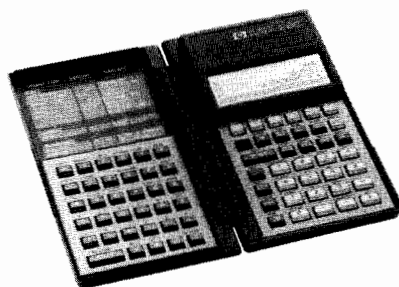
The HP-41 calculator and HP-71 Handheld Computer are expandable and highly customizable. The Custom Products Program provides personalized solutions for your applications. To assemble completely portable systems, as well as to communicate with instruments and computers, use the versatile HP-IL Interface.

The HP-94 Handheld Industrial Computer is expandable, rugged, portable—designed for industrial use.

Business Calculators
HP-12C Programmable Financial Calculator

The HP-12C is a powerful financial calculator that is a favorite of business professionals in banking, real estate and investment. It features Time Value of Money functions, discounted cash flow functions (NPV and IRR), plus bond functions that calculate yield-to-maturity and price.

NEW

HP-18C
The Business Consultant

Business Consultant

This innovative calculator for business professionals sets a new standard in ease of use. Standard business formulas are built in, and menus and softkeys make these functions easy: interest rates, payment schedules, statistics, internal rate of return, markup and margin, interest rate conversions, and time and appointments. A unique formula solver function allows users to enter formulas for personalized business problems in their own words. The calculator has a four-line by 23-character LCD display plus separate alpha and numeric keyboards. Application booklets are available. Features a wireless infrared printer interface.

Scientific Calculators
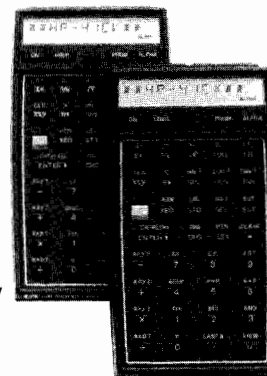### HP-11C Programmable Scientific Calculator

Scientists, engineers and mathematicians will use these built-in functions: statistics, a random number generator, trigonometrics, hyperbolics and inverses as well as permutations and combinations. The HP-11Cs programmability allows subroutine and indirect addressing plus conditional tests and flags.

HP-15C Programmable Scientific Calculator With Matrices

The HP-15C has special functions that help scientists, engineers and mathematicians solve problems involving matrices and complex arithmetic. Built-in matrix functions operate on up to five matrices (a maximum of 64 elements). The HP-15C has SOLVE and integration functions built in for doing derivatives and integrals, plus 448 program lines with insert and delete editing.

HP-16C Programmable Calculator for Computer Science

The HP-16C is specifically designed for computer science and digital electronic applications. Number base modes make it easy to convert between binary, octal, decimal and hexadecimal bases. In addition to calling and editing programs, the HP-16C has extensive bit manipulation capability.

HP-41CV

HP-41CX

HP-41CV and HP-41CX Advanced Programmable Calculators

The HP-41CV and HP-41CX provide the heart of expandable computational systems. In addition to input/output capability, they provide portability and touch-key simplicity.

In addition to all the built-in functions of the HP-41CV, the HP-41CX features built-in Time and Extended Functions/Memory modules, a text-file editing function and 19 other functions.

Choose from a broad range of HP-written Application Pacs and Solutions Books plus Users' Library programs. A Custom Products Program is available for those who require customized software solutions in large quantities (see page 63.)

HP-41 Specifications

User memory (bytes): 2,233 (319 registers) built into HP-41CX/CV; 6,433 (919 registers) maximum.

Extended memory (bytes): 868 (124 registers) built into HP-41CX; HP 82180A Extended Functions/Memory Module, 868 (124 registers) optional for HP-41CV.

Extended memory modules (bytes): HP 82181A Extended Memory Module, 1,666 (238 registers) optional for HP-41CX/CV.

Built-in functions: Over 200 in HP-41CX; over 128 in HP-41CV.

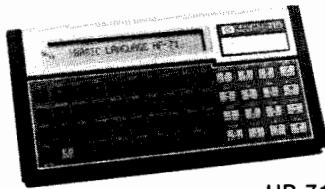**Keyboard:** Redefinable, alphanumeric (HP-41CX/CV).

Display: LCD, 10 digits; 12 alpha characters (scroll to 24) (HP-41CX/CV).

HP-71B

HP-94

Power requirements: Four 1.5V, size N batteries (HP-41CX/CV).
Size: 3.3 x 7.9 x 14.2 cm (1.3 x 3.1 x 5.7 in) (HP-41CX/CV).

HP-71 Handheld Computer

The HP-71 Handheld Computer is a powerful computational tool for individuals and is also well suited to manufacturing applications like quality control, portable data acquisition and test instrument control. Its full CMOS CPU has a 4-bit intelligent external bus and 64-bit internal registers.

The HP-71 uses a powerful BASIC language that runs nearly as fast as compiled BASIC and allows structured programming techniques. It supports a sophisticated file management system and an advanced calculator mode (CALC). The operating system can be further enhanced by using FORTH or assembler languages.

Optional HP-IL interfacing provides input/output capability, and four ports accept memory modules or application software. Customize applications through the Custom Products program.

Documented internal specifications allow development of hardware, software, interfaces and firmware. (See the Custom Products and Programming Development Aids on page 63.)

HP-71 Specifications
User memory (bytes): 17.5K built in, 33.5K (145.5K using value-added supplier modules) maximum
Read only memory (bytes): 64K built in, 320K maximum.
Memory modules (bytes): HP 82420A, 4K (user memory—add a maximum of four); 16K, 32K, 48K or 64K (read only memory—add a maximum of four).
Transfer rate (bytes/sec): 8K (copying to a loop, no devices on loop); 6.4K (copying in a file); 4.5K (OUTPUT statement, no formatting (USING)); 4K (ENTER statement, no formatting (USING) and version 1B of the HP-IL module).
Programming languages: HP BASIC (built in); FORTH and assembler (optional).
Keyboard: Block QWERTY, redefinable, alphanumeric with separate numeric keypad.
Display: LCD, 22 characters (scroll to 96).
Power requirements: Four 1.5V, size AAA alkaline batteries.
Size: 19 x 9.7 x 2.5 cm (7.5 x 3.8 x 1.0 in).

HP-94 Handheld Industrial Computer

The high-quality, rugged and compact HP-94 Handheld Industrial Computer is designed for field data collection and item tracking. Application software for the HP-94 is developed in BASIC or assembly language using the HP 82520A Software Development system and a computer like the HP Vectra PC or IBM PC, PC/XT or PC/AT. Programs are downloaded from the development system via a serial interface cable and level converter.

The HP-94 has a serial interface that provides RS-232C protocol with 0-5 volt signal levels, a built-in bar code interface and an audio jack for use in noisy environments. The backlit display makes it easy to read in dark locations.

The serial interface permits communication with a host computer, software development system, modems, printers and other peripherals at up to 9600 baud. Data can be entered with any one of the three bar code wands, the redefinable keyboard or the serial port.

The HP-94 reads popular bar codes including 3-of-9 Code, Interleaved 2-of-5 Code, UPC/EAN/JAN, Codabar, Code 128 and full ASCII Code 39. (HP 82431A Battery Recharger sold separately.)

HP-94 Specifications
User memory (bytes): 64K, 128K or 256K built in, 256K maximum.
Read only memory (bytes): 32K built-in operating system.
Options (bytes): With 64K or 128K built in, add either a 40K RAM card or a ROM/EPROM card; insert a maximum of 128K ROM or EPROM into the card.
Service upgrade (bytes): With 128K RAM built in, one additional 128K memory board can be installed in the HP-94E.

Maximum capacity (bytes): 256K
Transfer rate (baud): 150, 300, 600, 1200, 2400, 4800, 9600.
Programming languages: BASIC; assembler.
Keyboard: ABC format, redefinable, alphanumeric (numeric keypad by pressing a key).
Display: 4-line x 20-character LCD with backlight.
Power requirements: 4.8 volt rechargeable NiCad batteries.
Size: 14.6 x 16.5 x 3.8 cm (5.75 x 6.5 x 1.5 in).
Weight: 716 g (1.6 lb) with batteries.

Ordering Information	Price
HP-11C	$ 56.00 ☎
HP-15C	99.00 ☎
HP-16C	120.00 ☎
HP-12C	99.00 ☎
HP-18C Business Consultant	175.00 ☎
HP-41CV	175.00 ☎
HP-41CX	249.00 ☎
HP-71 Handheld Computer	525.00 ☎
HP-94D 64K-byte Handheld Industrial Computer	1,395.00
HP-94E 128K-byte Handheld Industrial Computer	2,095.00
HP-94F 256K-byte Handheld Industrial Computer	2,795.00

Enhancements and HP-IL Peripherals

Business Consultant
HP 82240A Thermal Printer
An infrared beam provides a cordless connection with the calculator from up to 18 inches away. Prints 24 characters per line in 5x8 dot matrix using the Roman-8 character set plus 10 additional special math characters. Uses batteries or optional AC adapter.

HP-41:
HP 82182A Time Module
With this module (built into the HP-41CX), the HP-41CV can become a time-scheduled system controller, alarm clock, appointment reminder, calendar, timer or even an advanced stopwatch.
HP 82160A HP-IL Interface Module
Plugs into any one of the four ports in the HP-41, connecting it with HP-IL peripherals and instruments, and to HP-IB, RS-232C and GPIO devices using interface converters. Gives the HP-41 control of up to 30 devices on the loop. Typical HP-41 transfer rate: 150 bytes/second.
HP 82183A Extended I/O Module
Provides 59 I/O functions beyond those provided by the HP 82160A HP-IL Module.
HP 82184A Plotter Module
Provides plotting and bar code printing capability for the HP-41 using the HP 82162A Printer/Plotter. Plotting programs are included in the module.
HP 82104A Card Reader
Allows programs and data to be saved on magnetic cards which contain 32 registers, 16 per side. Adds over 30 control functions to the HP-41.
HP 82143A Thermal Printer/Plotter
Quietly provides numeric, upper- and lower-case alpha, double-wide characters, high-resolution plotting capabilities, and intensity control. Allows user-defined special characters.
HP 82153A Optical Wand
Easily inputs data or programs into the HP-41 when passed across a printed page of HP-41 bar code.
00041-15042 Automatic Start and Cassette Duplication Module
Lets you write programs that automatically set status, configure memory, access peripherals, or provide prompts.

☎ Fast-Ship product — see page 766.

PERSONAL COMPUTERS & CALCULATORS
Personal Computation
HP-IL Instruments & Interfaces, HP-IL Interfaces for Other Computers

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00041-15043 HP-IL Development Module
Allows you to change the contents of any control register, poll certain status bits and add a second HP-41 to the HP-IL loop.

HP-71:

HP 82401A HP-IL Interface
Allows direct connection to any HP-IL product, and to HP-IB, RS-232C, and GPIO devices using interface converters. Facilitates simultaneous control of up to 30 devices on the loop.

HP 82402A Dual HP-IL Adapter
Allows the HP-71 to have two independent, isolated HP-IL loops simultaneously, using only one port and two HP-IL modules.

HP 82400A Card Reader
Provides inexpensive storage for programs and data. Cards can be encoded so they may be executed, but not viewed or edited, to ensure against overwriting. Provides automatic verification.

HP 92205K/L/M/N/P HP-IL Acoustic Couplers
Provides remote communications capabilities at 300 baud over telephone lines through HP-IL. Accesses "dial up" computer systems. Complies with European CCITT V21 requirements. Use with HP 82488A Data Communications Pac. (Europe only.)

HP-94:

HP 82520A Software Development System (SDS)
The SDS is used to develop application programs for the HP-94 in BASIC or 8088 assembly languages using the HP Vectra PC, IBM PC, PC/XT or PC/AT computer. See an HP sales rep for details.

HP 82470A RS-232C Level Converter
Converts the 0- to 5-volt signals sent from the HP-94 serial port to the ± 9-volt levels required to communicate with some RS-232C printers and modems. (HP 82435A cable required.)

HP 16965C, HP 16963C and HP 16961C Bar Code Wands
These high, medium and low resolution contact wands have rugged yet lightweight metal cases, replaceable sealed sapphire tips and high ambient light performance for operation in direct sunlight.

HP-41 and HP-71:

HP 82161A Digital Cassette Drive
Uses a digital-quality mini-cassette to store up to 128K bytes of information. Number of tracks, 2; Density, 335 bits/cm (850 bits/inch); format, 256 bytes/record (8 bits/byte); formatted capacity, 512 records (131,072 bytes).

HP 82162A Thermal Printer/Plotter
Provides numeric upper- and lower-case alpha, doublewide characters and intensity control.

The chief feature distinguishing the HP 82162A from the HP 82143A dedicated Printer/Plotter is that it has a 101-character buffer for enhanced graphics and bar code printing capabilities and a FORMAT function which automatically centers or justifies copy to the left and right margins.

HP 2225B ThinkJet Personal Printer
See numerical index for page number.

HP 9114B Disc Drive
See numerical index for page number.

HP 82168A Acoustic Coupler (modem)
Provides remote communications capabilities at 300 baud over telephone lines through HP-IL. Accesses "dial-up" computer systems. Use anywhere a conventional (G-type) receiver is available. When used with the HP-41, the Extended I/O Module is required.

Ordering Information	Price
HP-18C Business Consultant:	
HP 82240A Thermal Printer (110V)	135.00 ☎
HP 82241A Adapter, U.S. (110V)	15.00 ☎
HP-41:	
HP 82180A Extended Functions/Memory Module	75.00 ☎
HP 82181A Extended Memory Module	75.00 ☎
HP 82182A Time Module	75.00 ☎
HP 82160A HP-IL Interface Module	125.00 ☎
HP 82183A Extended I/O Module	75.00 ☎
HP 82184A Plotter Module	75.00 ☎
HP 82104A Card Reader	195.00 ☎
HP 82143A Thermal Printer/Plotter	385.00 ☎
HP 82153A Optical Wand	125.00 ☎
00041-15042 Automatic Start and Cassette Duplication Module	35.00 ☎
00041-15043 HP-IL Development Module	75.00 ☎

HP 82169A

HP-71:	
HP 82420A 4K-Byte Memory Module	75.00 ☎
HP 82401A HP-IL Interface	125.00 ☎
HP 82402A Dual HP-IL Adapter	85.00 ☎
HP 82400A Card Reader	165.00 ☎
HP 92205K HP-IL Acoustic Coupler (Belgium)	295.00
HP 92205L HP-IL Acoustic Coupler (U.K.)	295.00
HP 92205M HP-IL Acoustic Coupler (Germany)	295.00
HP 92205N HP-IL Acoustic Coupler (Other countries)	295.00
HP 92205P HP-IL Acoustic Coupler (France)	295.00
HP-94:	
HP 82520A Software Development System	795.00
HP 82470A RS-232C Level Converter	240.00
HP 16965C Bar Code Wand	TBA
HP 16963C Bar Code Wand	TBA
HP 16961C Bar Code Wand	TBA
HP-41 and HP-71:	
HP 82161A Digital Cassette Drive	550.00 ☎
HP 82162A Thermal Printer/Plotter	450.00 ☎
HP 82168A Acoustic Coupler	495.00 ☎

HP-IL Instruments and Interfaces
HP-41 and HP-71
Instrument Options

See numerical index for page numbers. HP 3468A Digital Multimeter; HP 3421A Data Acquisition/Control Unit; HP 5384A/HP 5385A Opt. 003 Frequency Counters; HP 1630A/D/G and HP 1631A/D Logic Analyzers; HP 4945A Transmission Impairment Measuring Set.

HP 82164A HP-IL/RS-232C Interface
Translates HP-IL signals into RS-232C signals, and vice versa, for connection of HP-IL systems with RS-232C systems. Provides bit-serial asynchronous data communication. AC adapter included.

HP 82169A HP-IL/HP-IB Interface
Permits linkage of HP-IL systems with HP-IB (IEEE 488, 1978) computers and lab equipment. When a controller is used, it can be either an HP-IL or HP-IB device. AC adapter included.

HP 82165A HP-IL/GPIO Interface
Allows HP-IL to control equipment operating with parallel bus structures. Contains I/O buffering and a built-in power supply that operates from an HP standard AC adapter that is included.

HP 92198A/B/C Mountain Computer HP-IL 80-Column Video Interface
Display data and listings on a standard video monitor. Add an RF modulator and use it with a conventional TV set.

HP-IL Interfaces for Other Computers
HP 82938A HP-IL/Series 80 Interface
Provides a communication link between portable battery-operable products and larger computers. Allows use of Series 80 built-in graphics.

HP 45643A Extended I/O Accessory
Provides a communication link between The PORTABLE and the Touchscreen, Touchscreen MAX and Vectra (and HP-71, using HP 82477A HP-IL Link software) computers via the HP-IL interface.

HP 82973A HP-IL Interface Card
Provides a communication link between The PORTABLE and IBM PC/XT (and HP-71, using HP 82477A HP-IL Link software) computers via HP-IL interfacing.

HP 82166C HP-IL Interface Kit
A design kit that provides the special components needed to incorporate HP-IL into other devices.

☎ Fast-Ship product—see page 766.

PERSONAL COMPUTERS & CALCULATORS
Personal Computation
Accessories, Custom Products & Programming Dev Aids, Users' Library

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Ordering Information

HP-41 and HP-71:

	Price
HP 82164A HP-IL/RS-232C Interface	295.00 ☎
HP 82169A HP-IL/HP-IB Interface	395.00 ☎
HP 82165A HP-IL/GPIO Interface	295.00 ☎
HP 92198A Mountain Computer HP-IL 80-Column Video Interface (U.S.)	295.00 ☎
HP 92198B Mountain Computer HP-IL 80-Column Video Interface (Europe)	340.00
HP 92198C Mountain Computer HP-IL 80-Column Video Interface (U.K.)	340.00
HP 82938A HP-IL/Series 80 Interface	295.00
HP 45643A Extended I/O Accessory	175.00 ☎
HP 82973A HP-IL Interface Card	150.00 ☎
HP 82166C HP-IL Interface Kit	395.00 ☎

Accessories

Accessories such as owner's manuals, programming pads, magnetic cards, thermal paper, battery packs, rechargers and software manuals are readily available for all types of HP calculators.

Custom Products and Programming Development Aids

Through customization, the powerful HP-41 and HP-71 can be tailored with personalized software to perform the functions that will increase performance productivity.

Using programs written by customers or value-added suppliers, the HP-41 and HP-71 can be customized using Custom ROMs, EPROMs and Keyboard Overlays. The HP-41 can also be customized with Custom Keyboard Touchpads and Bar Code.

The services of Independent Custom Consultants (ICCs) make the customization process easy. (A list of ICCs is available from your HP Sales Representative.) Choose and contact an ICC to help decide if customized HP products can help meet your needs.

HP-41:

HP-41CV or HP-41CX Opt. 001 Custom Calculator

The shifted function labels are removed from the keys, eliminating unnecessary and possibly distracting nomenclature.

HP 82504A Custom Keyboard Touchpads

Relabel the HP-41 keyboard with special functions assigned to each key. Available in a variety of background and printing colors.

HP Bar Code

Provides cost-efficient storage on paper that's easy to use, duplicate and distribute.

HP-71:

HP 82440A Software Development Utility

Allows development of HP-71 BASIC, FORTH or assembly language source files using an HP-86, HP-87 or IBM PC.

HP 82477A HP-IL Link

This software enables transfer, via HP-IL, of most types of files between the HP-71 and MS-DOS personal computers that have HP-IL capability. It allows the PC to be used as a full-sized keyboard and display for the HP-71.

HP 82478A FORTH Assembly/Debugger

Provides an extended software development environment for the HP-71, and allows you to control execution and view status information of an assembly language program. The FORTH operating system is very effective for instrument control applications. FORTH routines can be called from BASIC and vice versa.

Plug-In Module Simulation Procedure (PMSP)

Simulate any Custom ROM Module developed for the HP-71 through one of its memory ports. This sheet explains the procedure (available through an HP Sales Representative or ICC).

☎, Fast-Ship product — see page 766.

HP-71 Internal Design Specifications (IDS) Documents

00071-90068 Volume I: Detailed Design Description

00071-90069 Volume II: Entry Point and Poll Interfaces (Use with 1BBBB version of HP-71 operating system.)

00071-90070 Volume III: Operating System Source Listings (Use with 1BBBB version of HP-71 operating system.)

00071-90104 Volume II: Entry Point and Poll Interfaces (Use with 2CCCC version of HP-71 operating system.)

00071-90105 Volume III: Operating System Source Listings (Use with 2CCCC version of HP-71 operating system.)

82401-90023 Internal Design Specifications, HP-IL

Provides details on the HP-IL interface, including entry points and source code listing.

00071-90071 Hardware Design Specifications

Provides details on hardware bus specifications.

HP-41 and HP-71 Custom ROM Modules

HP-41: HP 82508A/B, HP 82509A/B

Provide 4K or 8K bytes of memory with each module, or nearly 21,000 program lines with up to four 8K-byte modules.

HP-71: HP 82491A/B, HP 82492A/B, HP 82493A/B, HP 82494A/B

Provide 16K, 32K, 48K or 64K bytes of program storage in a plug-in module. May be used in quantities of one to four for a maximum capacity of 256K bytes of ROM. (Minimum order: 100 modules.)

HP-41 and HP-71 Custom Keyboard Overlays

HP-41: HP 82501A
HP-71: HP 82487A

Relabel the keyboard with special user-defined functions assigned to each key. Available in a variety of colors.

Ordering Information

HP-41:

	Price
HP-41CV Opt. 001 Custom Calculator	175.00
HP-41CX Opt. 001 Custom Calculator	249.00

HP-71:

HP 82440A Software Development Utility	35.00 ☎
HP 82477A HP-IL Link	95.00 ☎
HP 82478A FORTH Assembly/Debugger	175.00 ☎
00071-90068 Volume I: Detailed Design Description	50.00
00071-90069 Volume II: Entry Point and Poll Interfaces (Use with 1BBBB version of HP-71 operating system.)	50.00
00071-90070 Volume III: Operating System Source (Use with 1BBBB version of HP-71 operating system.)	200.00
00071-90104 Volume II: Entry Point and Poll Interfaces (Use with 2CCCC version of HP-71 operating system.)	50.00
00071-90105 Volume III: Operating System Source (Use with 2CCCC version of HP-71 operating system.)	200.00
82401-90023 Internal Design Specifications, HP-IL	60.00
00071-90071 Hardware Design Specifications	200.00

☎ Fast-Ship product — see page 766.

Users' Library

The Users' Library is a source of programs written and submitted by users of HP-41 calculators and the HP-71 Handheld Computer. Documentation includes instructions and program listings. Software is available prerecorded on magnetic cards, mini-cassettes, or HP-IL 3½" discs. A custom cassette/disc duplication service is available. Subscribers receive a complete list of programs, plus notification of special discounts, contests and special promotions. For more information, contact the Users' Library, Dept. 39UL, 1000 N.E. Circle Blvd., Corvallis, OR 97330.

Software

HP offers software packages as application pacs, solutions books and application booklets. Application pacs come with a manual, plug-in module, and when applicable, prerecorded magnetic cards, a keyboard overlay and quick reference card. Solutions books come with complete documentation. Magnetic cards, mini-data cassettes or HP-IL 3½" discs are available. Application booklets stand alone. Available from dealers and HP Representatives.

HP-11C:	Price
00011-90009 HP-11C Solutions Handbook	15.00 ☎

HP-12C:

00012-90021 HP-12C Leasing Applications Handbook	15.00 ☎
00012-90015 HP-12C Real Estate Applications Handbook	15.00 ☎
00012-90009 HP-12C Solutions Handbook	15.00 ☎
00012-90022 HP-12C Training Guide	15.00 ☎

HP-15C:

00015-90011 HP-15C Advanced Functions Handbook	15.00 ☎

Business Consultant:
Application booklets

00018-90034 Banking Consultant	7.95 ☎
00018-90035 Business Finance Consultant	7.95 ☎
00018-90036 Direct Sales Consultant	7.95 ☎
00018-90037 Manufacturing Consultant	7.95 ☎
00018-90038 Marketing Consultant	7.95 ☎
00018-90039 Personal Investment Consultant	7.95 ☎
00018-90040 Real Estate Consultant	7.95 ☎
00018-90041 Small Business Consultant	7.95 ☎

HP-41:
Application Pacs

00041-15055 HP-41 Advantage	$49.00 ☎
00041-15018 Aviation (for pre-flight use)	35.00 ☎
00041-15024 Clinical Lab & Nuclear Medicine	35.00 ☎
00041-15006 Circuit Analysis	35.00 ☎
00041-15004 Financial Decisions	35.00 ☎
00041-15049 Math/Statistics	45.00 ☎
00041-15022 Games	35.00 ☎
00041-15023 Home Management	35.00 ☎
00041-15016 Real Estate	45.00 ☎
00041-15019 Thermal & Transport Science	35.00 ☎
00041-15039 Petroleum Fluids	75.00 ☎
00041-15026 Securities	35.00 ☎
00041-15001 Standard Applications	35.00 ☎
00041-15002 Statistics	35.00 ☎
00041-15027 Stress Analysis-Mechanical Engineering	35.00 ☎
00041-15021 Structural Analysis-Civil Engineering	45.00 ☎
00041-15005 Surveying	35.00 ☎
00041-15020 Machine Design	35.00 ☎
00041-15017 Navigation	45.00 ☎
00041-15042 Auto/Start Duplication ROM	35.00 ☎
00041-15043 HP-41 HP-IL Development Module	75.00 ☎

Solutions Books
Business:

00041-90094 Business Statistics/Marketing/Sales	15.00 ☎
00041-90096 Home Construction Estimating	15.00 ☎
00041-90086 Lending, Savings, & Leasing	15.00 ☎
00041-90136 Real Estate	15.00 ☎
00041-90137 Small Business	15.00 ☎

Engineering:

00041-90093 Antennas	15.00 ☎
00041-90100 Chemical Engineering	15.00 ☎
00041-90089 Civil Engineering	15.00 ☎
00041-90092 Control Systems	15.00 ☎
00041-90088 Electrical Engineering	15.00 ☎
00041-90139 Fluid Dynamics & Hydraulics	15.00 ☎
00041-90140 Heating, Ventilating & Air Conditioning	15.00 ☎
00041-90090 Mechanical Engineering	15.00 ☎
00041-90138 Solar Engineering	15.00 ☎
00041-90441 Structural Design (cassette based)	35.00 ☎

Computation:

00041-90084 Geometry	15.00 ☎
00041-90083 High-Level Math	15.00 ☎
00041-90082 Test Statistics	15.00 ☎

Other:

00041-90145 Calendars	15.00 ☎
00041-90102 Chemistry	15.00 ☎
00041-90099 Games I	15.00 ☎
00041-90443 Games II	15.00 ☎
00041-90143 Optometry I (General)	15.00 ☎
00041-90144 Optometry II (Contact Lenses)	15.00 ☎
00041-90142 Physics	15.00 ☎
00041-90141 Surveying	15.00 ☎
00041-90395 Time Module Solutions I	15.00 ☎

HP-71:
Application Pacs

HP 82481A AC Steady State Circuit Analysis	75.00 ☎
HP 82484A Curve Fitting	95.00 ☎
HP 82479A Data Acquisition	195.00 ☎
HP 82488A Data Communications	95.00 ☎
HP 82482A Finance	75.00 ☎
HP 82480A Math	95.00 ☎
HP 82440A Software Development Utility (with mini-cassette)	35.00 ☎
HP 82489A AMPI (TM) Statistics	95.00 ☎
HP 82483A Surveying	95.00 ☎
HP 82485A Text Editor	75.00 ☎
HP 82490A HP-41 Translator	95.00 ☎

Solutions Books

00071-90065 Games	15.00 ☎
00071-90066 General Utilities	15.00 ☎
00071-90064 Math	15.00 ☎

AMPI™ Statistics is a trademark of American Micro Products, Inc.

Hewlett-Packard Interface Loop (HP-IL)

The Hewlett-Packard Interface Loop, HP-IL, is a bit-serial interface designed for low cost battery-operable systems. HP-IL allows HP-41 calculators and HP-71, The PORTABLE, HP 150 and other computers to be used as system controllers, capable of transmitting and receiving data, and performing a wide variety of information management functions. In addition, HP-IL allows the HP-41 and HP-71 to be used for instrument control.

In HP-IL systems, devices are connected by two-wire cables leading from the output port of one device to the input port of the next, until all devices form a closed loop. This loop structure provides a unique capability through: auto address assignment, device capability identification, power ON/OFF control, and error checking.

For additional information or a demonstration of Hewlett-Packard professional calculators and handheld computers, visit your nearest HP sales representative or HP dealer. In the US, for the location and number of the one nearest you call toll-free 1-800-FOR-HPPC (1-800-367-4772).

☎ Fast-Ship product — see page 766.

HP-IL Products and Applications Summary

Model	Application	See Page
HP-41 Advanced Calculator (with HP 82160A HP-IL Interface Module)	Control: HP-IL bench/field controller Computation: Field data collection	60
HP-71 Handheld Computer (with HP 82401A HP-IL Interface)	Control: HP-IL bench/field controller Computation: Data acquisition, field analysis	61
Series 80 Personal Computers (with HP 82938A Interface)	HP-IL bench controller; field data analysis control	82
The PORTABLE (with HP-IL built in)	Computation and field analysis Remote transaction processing Battery or AC operation	54
The PORTABLE PLUS (with HP-IL built in)	Computation and field analysis Remote transaction processing Battery or AC operation	55
The Integral PC (with HP 82924A HP-IL Interface)	HP-IL bench controller; field data analysis control	81
HP 82402A Dual HP-IL Adapter	Allows two HP 82401A HP-IL modules to be plugged into the HP-71 simultaneously.	62
HP 82169A HP-IB Interface	Bench conversion from HP-IL to IEEE-488 computers, peripherals and instruments	62
HP 82164A RS-232C Interface	Bench conversion between HP-IL and RS-232C signals for terminals, modems, computers and peripherals	62
HP 82165A GPIO Interface	Bench conversion between HP-IL and parallel devices Digital data acquisition interface from HP-IL to most computers	62
HP 82938A Series 80 Interface	Bench conversion from HP-IL to Series 80 Personal Computers	62
HP 82166C HP-IL Interface Kit	Components that can be built into a device, providing HP-IL capability	62
HP 45643A Extended I/O Accessory	Driving HP-IL peripherals, including ThinkJet, plus parallel printers Allows communication between The PORTABLE and Touchscreen, and Touchscreen MAX	62
HP 82973A HP-IL Interface Card	Allows communication, using HP-IL, between The PORTABLE and the IBM PC/XT. Driving HP-IL peripherals	62
HP 82161A Digital Cassette Drive	Bench/field program storage Bench/field data storage Bench/field data logging Field data collection	62
HP 82162A Thermal Printer/Plotter	Bench/field hard copy Data logging Simple plotting Computational hard copy	62
ThinkJet Printer (HP-IL option)	Bench/field full-page, hard-copy output Low noise environments High-resolution graphics and text Battery operation	106

Model	Application	See Page
HP 9114B 3½" Flexible Disc Drive (with HP-IL built in)	Bench/field program storage Bench/field data storage Bench/field data logging Bench/field data collection Bench/field data exchange with Series 80 and Series 200 personal computers Battery or AC operation	100
HP 82168A Acoustic Coupler (Modem)	Remote communications capability Telephone data access	62
HP 1630A/D/G and HP 1631A/D Logic Analyzers	Bench logic design, development, and testing Digital diagnosis and debugging Timing analysis, state analysis, performance analysis, and interactive state/timing analysis	397
HP 3421A Data Acquisition/Control Unit	Bench/field automated measurement, channel selections and control Lab bench experimentation and control Portable experimentation and data collection	292 293
HP 3468A/B Digital Multimeters	Bench/field automated measurement Scientific experimentation Lab bench experimentation & trouble shooting Bench/field automated service & diagnostic tool	198 199
HP 4945A Transmission Impairment Measuring Set (TIMS)	Bench testing of voice grade data channels, program channels, and high speed digital channels Master/slave capability for end-to-end testing Automatic gain slope measurement Programmable sweep	372
HP 5384A/HP 5385A Opt. 003 Frequency Counters	Bench, systems, field-automated measurement	374

HP-IB and HP-IL

HP-IL is a low-cost, low-power alternative below HP-IB in price and performance.

Although HP-IB and HP-IL serve the same basic function—interfacing controllers, instruments and peripherals—they differ in many respects.

1. Because of HP-IL's lower power consumption, it is usable with portable, battery-powered systems. Generally, HP-IB is not.

2. HP-IL system components will generally be low cost and have moderate performance; HP-IB system components are medium- to high-performance and generally cost more.

3. HP-IL systems work at relatively low data rates compared to HP-IB, and relatively high data rates compared to RS-232C. For example, the HP-71 and The PORTABLE can transmit at speeds of 5K to 6K bytes per second (50,000 to 60,000 baud on RS-232C). HP-IL maximum data rate at a 100 metre distance is 20K bytes per second; this rate is not dependent on HP-IL cable length.

4. HP-IL allows device separations of up to 100 metres with shielded, twisted pairs (10 metres with zip cord). HP-IB requires extender hardware for long distance connections.